

## REMARKS

This amendment is submitted in response to the office action dated November 1, 2006. Applicants amend claim 36, so that it further clarifies the claimed invention, as requested by Examiner. The amendment to Claim 36 does not raise new matter and therefore raises no new issues. Claims 1-8, 10-14, 17 and 35-41 are pending in the present application.

### Claim Rejection – 35 U.S.C. §112 Rejections

Claims 39-41 are rejected under 35 USC 112, first paragraph, and claim 36 is rejected under 35 USC 112, second paragraph.

In response to the §112, first paragraph rejection, Applicants argue that claims 39-41 do meet the written description requirement. Claim 35 requires a third boundary between the N+ doped region and the P-well or the N-doped layer, thereby claiming in the alternative. However, the Examiner states that claims 39-41 do not meet the requirements of §112, first paragraph because there is no support in the specification for a device that meets the requirements of the claim 35 and the limitations set forth in the respective dependent claims. Applicants have in their previous response shown support in the specification for devices claimed in claims 39-41, and therefore Applicants respectfully request withdrawal of the rejection, as the rejection is in error.

Applicants have used alternative language, therefore claim 35 requires fulfillment of only one of the listed alternatives. The MPEP states, “[a]lternative expressions using “or” are acceptable.” MPEP §2173.05(h). Using the phrase “or” does not require that both limitations must be met, rather “or” means that the device must satisfy only one of the listed alternatives in the claim, much like a Markush expression is used in chemical or other applications. Therefore, claims 39-41 are proper claims in that they are limiting claim 35, specifically claiming a listed alternative of claim 35. Claims 39-41 do not need to satisfy both conditions, as stated by the Examiner in the Office Action; the claims are proper limiting claims enumerating which condition they satisfy in claim 35 (i.e. whether the third boundary is N+ doped region and the N- doped layer or the N+ doped region

and the P- doped well). The Examiner has stated that both possibilities must be met by device in the limiting claims, which is not correct. Applicants traverse the Examiner's finding that both possibilities must be met, because the use of "or" in the claim language is proper alternative language providing that only one condition must be met.

Accordingly, Applicants respectfully request withdrawal of the rejection based on §112, first paragraph.

With respect to the rejection of claim 36 based on §112, second paragraph, Applicants respectfully request withdrawal of the rejection in view of the amendment clarifying the claim. This amendment does not contain any new matter, and therefore does not present any new issues.

#### **§103(a) Rejections**

Responsive to the Examiner's rejection of claims 1-8, 10-15, and 17 under 35 U.S.C. 103(a) as being unpatentable over Choy in view of Schlangenotto '428 and '858, all of record, Applicants respectfully disagree. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art, among other criteria. *See* MPEP §706.02(j).

Claim 1 requires a N<sup>+</sup> doped region to be laterally spaced from the P- doped well. The Examiner states that Choy depicts four N<sup>+</sup> doped regions in Figure 4, showing that each N<sup>+</sup> doped region is "located on the right side of the figure clearly away from the P doped well located on the left side of the figure." The Examiner does not account for each N<sup>+</sup> doped region being located within the P doped well, and therefore cannot be spaced laterally from the P doped wells as recited in claim 1. Claim 1 requires that the N<sup>+</sup> regions be laterally spaced from the P- doped wells and not within the P- doped wells. Therefore, Choy does not teach an element of claim 1.

Moreover, Schlangenotto '428 and '858 does not show the missing elements of Choy. These references are used merely to show the size recited in claim 1 as well as the use of recombination centers, but not to show the use of laterally spaced N<sup>+</sup> regions from P- wells. Furthermore, the references do not teach the use of the claimed elements.

Specifically, Applicants claim that the recombination centers are substantially within the N- doped layer and the P- doped wells. The Examiner admits that the Schlangenotto reference does not teach recombination centers formed substantially in any one area, stating, “[t]herefore, since Schlangenotto teaches forming recombination centers throughout the diode, these recombination centers would be present in the N- doped layer and P- doped well.” The Examiner is discounting that the recombination centers are disposed substantially within certain areas (the N- doped layer and the P- doped wells). Schlangenotto does not teach forming recombination centers in substantially one area as opposed to other areas of the diode, and the Examiner admits that there is no such teaching within the reference. Accordingly, the references do not teach another element of the rejected claim. Applicants respectfully request withdrawal of the rejection based on §103(a), because the references either singly or in combination do not teach all the claimed elements and limitations.

Since claims 2-8, 10-15, and 17 all depend from claim 1, they incorporate each and every element and limitation of claim 1. Since the references do not either independently or in combination teach or suggest all the elements of claim 1, the references cannot render these dependent claims obvious.

Responsive to the Examiner’s rejection of claims 35-41 under 35 U.S.C. 103(a) as being unpatentable over Temple in view of Schlangenotto ‘428 and ‘858, all of record, Applicants respectfully disagree. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *See* MPEP §706.02(j).

The Examiner, relying on Temple, states that Figure 8 shows the elements of claim 35, however, fails to show each and every claimed element. For instance, the Examiner states that Temple shows a device having a P+ doped region that is vertically thinner than the P- doped well and the N+ doped region, but does not provide support for such a finding in the reference. Applicants were unable to find support in the specification or figures for the assertion by the Examiner that the device disclosed by Temple in fact teaches a device having a P+ doped region that is vertically thinner than

the P- doped well and the N+ doped region. Applicants therefore traverse the rejection and request withdrawal of the rejection based on §103(a). Furthermore, for the reasons stated above, the Schlangenotto references do not apply or make up for the elements missing in Temple.

In sum, the rejections of all the claims based on §103(a) is erroneous. The art of record has been considered and does not render obvious the invention as now claimed whether viewed singly or in combination. The primary references (Choy and Temple) do not show or suggest the claimed inventions and the secondary references (Schlangenotto '428 and '858) do not make up for the deficiencies of the primary references. Applicants have demonstrated differences between the invention and the art applied to the claims and have provided persuasive evidence of dramatic and unpredicted results.

Reconsideration of the application, including consideration of the evidence of unpredicted results found in Table 1 are requested. In view of the above showing, the invention is patentable over the art of record and a notice of allowance is requested.

Applicants appreciate the opportunity to call the Examiner but believe that this amendment to the claims and the forgoing remarks fully address the issues raised by the Examiner. On the other hand, the Examiner is invited to call the undersigned if he has any matters to address that will facilitate allowance of the application.

Applicants respectfully request favorable consideration and that a timely Notice of Allowance be issued in this case.

In the event that Applicant has overlooked the need for an extension of time, additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefore and authorize that any changes be made to Deposit Account No.: 50-3010.

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Respectfully submitted,



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